

REMARKS

Claims 1-20 are pending and were rejected in the last Office Action as obvious over United States Patent No. 6,758,943 to *McConnell et al.* It was noted the '943 patent qualified as prior art only under 35 USC §102(e).

Applicant submits herewith the enclosed *Declaration Under 37 CFR §§1.131, 1.132 of Phuong Van Luu* which establishes an invention date prior to December 27, 2001, the effective date of the '943 patent as a reference. In addition, it is noted that the present invention provides unexpectedly superior moisture barrier properties and the pending claims are believed patentable for this reason as well. Accordingly, this application is believed in condition for allowance.

There are numerous differences between the present invention and the references of record, which actually teach away from the present invention. For example, it is noted that the '943 patent (not prior art in any event) relates to stearamide repellent agents and that other components (i.e., wax) are optional and must be present in amounts of less than 20%:

...other materials, such as sizing agents, waxes, and latexes, may also be included. When included, the amounts of the other materials comprise less than 20% of the total composition of the repellent agent, preferably less than 10% of the total composition of the repellent agent, and more preferably less than 5% of the total composition of the repellent agent, and even more preferably less than 2% of the total composition of the repellent agent.

'943 patent, Col. 1, lines 41-48.

McConnell et al. '943 thus specifies wax as an optional component and does not remotely suggest heating an applied wax emulsion above the melting temperature of the wax to fuse the wax and provide a hydrophobic surface, a salient feature of the invention. *Note* Claim 1 of the present application, reproduced below:

1. A method of making an absorbent cellulosic web resistant to moisture penetration comprising:

- (a) wetting at least one surface of the web with an aqueous dispersion including a wax and an emulsifier; and
- (b) heating the web above the melting temperature of the wax to fuse the wax of the dispersion and to provide a hydrophobic surface on the web, the wax being disposed in the web so that the open interstitial microstructure between fibers in the web is substantially preserved and the web has a laterally hydrophobic surface which exhibits a moisture penetration delay of at least about 2 seconds as well as a contact angle with water of at least 50 degrees at one minute of contact time with the web.

Another significant distinction is that *McConnell et al.* apply repellent or sizing agent to the fibers at the wet end. See *McConnell et al.* '943, Col. 7, lines 57-64. This completely eliminates the possibility of obtaining differential wetting properties between the two surfaces of the web which is readily achieved with the present invention. The pending claims specifically require that an aqueous dispersion, including wax and an emulsifier, is applied to a surface of the web. This makes it possible to obtain the differential wetting properties making the invention of this application so outstandingly unique.

Regarding *McConnell et al.* '943 in general, it is noted that a very weak sheet is produced because of the large amount of debonder used. The Example 1 sheet of *McConnell et al.* '943 had a geometric mean tensile of 320 g/3", versus GMT values of more than 3000 g/3" for treated towel of the invention. Note Table 1 of the application as filed; p. 38 of the application as filed; p. 12 of the published application. Moreover, the "Absorbency Rate" of *McConnell et al.* '943 (Col. 4, lines 1-31) is not believed comparable to the moisture penetration delay as is claimed in this application. Compare *McConnell et al.* '943, Col. 4, lines 1-31:

As used herein, the "Absorbency Rate" is a measure of the water repellency imparted to the tissue by the repellent agent. The Absorbency Rate is the time it takes for a product to be thoroughly saturated in distilled water. To measure the Absorbency Rate, samples are prepared as 3 inch squares composed of 2 different product sheets. In this instance the sheets in Examples 1A to 1E are from one product having a 1-ply sheets having a single blended layer; the sheets from Examples 2A to 2E are from a product having two 2-ply sheets having two identical layers. Six (6) sheets are conditioned by placing them in an oven at 105° C. for 5 minutes. The samples are draped over the top of a 250 ml beaker and covered with a 5 by 5 in. template having a 2 in. diameter opening. An amount of distilled water is dispensed from a pipette (0.01 cc for 1-ply samples; 0.1 cc for 2-ply samples) positioned 1 in. above the sample and at a right angle to the sample, and a timer accurate and readable to 0.1 sec. is started when the water first contacts the sample. The timer is stopped when the fluid is completely absorbed. At least six samples are tested; two readings are taken from one side of the sample(s), and two readings are taken from the opposite side. The end point of timing is reached when the fluid is absorbed to the point where light is not reflecting from the surface of the water on the sample. Results are recorded to the nearest 0.1 sec. The absorbency rate is the average of the four absorbency readings (the two on one side and the two on the other side of the sample). A minimum of six samples are tested and the test results are averaged. All tests are conducted in a laboratory atmosphere of 23+/-1° C. and 50+/-2% RH, and all samples are stored under these conditions for at least 4 hours before testing.

with paragraph 101 of the present application:

[0101] In order to measure the moisture penetration delay of a surface of absorbent sheet, single or multiply, a sample is conditioned at 23° C. and 50% relative humidity. The conditioned sample is secured lightly in a frame without substantial stretching in either the machine or cross-direction, but with sufficient tension in all directions such that the sheet is smooth. The sheet is suspended in the frame horizontally such that both surfaces of the sheet are not in contact with any other surface, that is, in contact with air only, since a surface in contact with the sheet can significantly influence moisture penetration delay times. The surface to be characterized is oriented upwardly and a 0.10 ml droplet of colored water is placed gently thereon. A timer is started simultaneously with the placement of the colored water droplet on the surface and stopped when the droplet is completely absorbed into the sheet and no longer projects upwardly from the surface as observed visually with the naked eye. The time is recorded as the moisture penetration delay. Testing is conducted at room temperature.

Note that the *McConnell et al.* '943 methodology eliminates the possibility of even identifying sheets having differential wetting surfaces inasmuch as 2 tests are performed on each side and the results of all 4 tests are averaged.

For the foregoing reasons, and for the reasons noted in the enclosed *Declaration Under 37 CFR §§1.131, 1.132 of Phuong Van Luu* this application is in condition for allowance. In particular, note paragraph 8 of the *Declaration*, where unexpectedly superior results are enumerated:

8. Regarding the technical merits of the present invention, I am convinced that the present invention is unexpectedly effective at preventing moisture penetration as compared with *McConnell et al.* '943 patent or any other reference of which I am aware. Note Table 3 and paragraph 153 of the application as published:

TABLE 3

Wetted Surface Area (in cm ²) of Layers Under 1 PSI Pressure						
Towel Web Structure		Control	Example 14 (FIG. 8)	Example 15 (FIG. 9)	Example 16 (FIG. 10)	Example 17 (FIG. 11)
Top	Layer 1	17.2	0	0	8.3	0
Ply	Layer 2	17.2	0	14.9	8.3	19.1
Bottom	Layer 3	18.5	25	22.7	21.8	20
Ply	Layer 4	18.5	25	22.7	21.8	20

[0153] The multilayer structure exhibited an unexpectedly complete barrier to moisture penetration when the two treated surfaces of the towel were placed in contact with one another (Example 14). In all cases, the treated sheet exhibited resistance to moisture penetration and increased wetted areas in some plies over the control, suggesting migration of the emulsifier into the sheet.

This response is believed timely. If an extension becomes necessary, please consider this paper a *Petition* therefor and charge our Deposit Account No 50-0935.

Respectfully submitted,



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